

REMARKS

Claims 1 and 3 through 8 are currently pending in the application.

This amendment is in response to the final Office Action of October 8, 2003.

35 U.S.C. § 103(a) Rejections

Obviousness Rejection Based on Nguyen (U.S. Patent 5,155,066)

Claims 1, 3, 4, 6, 7 and 8 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Nguyen (U.S. Patent 5,155,066). Applicant respectfully traverses this rejection, as hereinafter set forth.

In the Office Action it is asserted that "the applicant has not specifically disclosed heating a die before contacting the snap curable adhesive on a lead frame solves any stated problem or is for any stated reason except that the heat effects the curing of the snap curable commercially available 505 epoxy adhesive. It would have been obvious to one of ordinary skill in the art to heat the semiconductor die to effect the curing of the snap curable commercially available 505 epoxy adhesive as all that is necessary is to cure the snap curing adhesive with the semiconductor die on the adhesive, which is thereon a lead frame." Applicant interprets the assertion to indicate that it is considered obvious to modify Nguyen's cure method (which heats lead-frame/die assemblies) to arrive at a method in which heat is applied to the adhesive through the semiconductor die as the heated die is pushed into contact with the adhesive.

After carefully considering the cited prior art, the rejections, and the Examiner's comments, Applicant has amended the claimed invention to clearly distinguish over the cited prior art. Applicant has presently amended claim 1 such that it now makes explicit that the hot semiconductor die is pressed against the adhesive on the lead frame, deforming the adhesive in order to have sure contact between the adhesive and the die. The Specification provides ample support for the amendment in the Specification, page 17, lines four to seven: "When a semiconductor device is pressed against the semiconductor device site, the adhesive is pressed to have a thickness of approximately 0.001 inch." Applicant has further amended claim 1 to require that the semiconductor die be heated to the curing temperature of the adhesive. Support from the Specification can be found at page 4, lines 11 through 22. The only heating apparatus disclosed

is the block which supports the die, heats it, and presses it against the lead frame. Thus, the snap-curing adhesive clearly receives the heat to cure indirectly from the block, and thus the die must be heated to such a temperature as to effect a snap-cure of the adhesive.

Claim 6 has been amended such that it describes an embodiment of the invention contemplated by Applicant in which the adhesive is applied to a semiconductor die rather than the lead frame. Support for the amendment comes from the Specification at page 5, lines 4 through 7 where it is stated that "[t]he application means may also optionally include one or more nozzles positioned to deposit the curable adhesive in a desired location n either the lead frame or the active surface of a semiconductor device."

Applicant respectfully submits that with respect to the claims as presently amended, the cited prior art fails to establish a *prima facie* case of obviousness under 35 U.S.C. § 103 regarding the presently claimed invention because there is not suggestion whatsoever to modify the method of Nguyen as proposed in the Office Action. Applicant submits that to establish a *prima facie* case of obviousness under 35 U.S.C. § 103 three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Third, the cited prior art reference must teach or suggest all of the claim limitations. Furthermore, the suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicant's disclosure.

First, neither Nguyen nor the knowledge available to one "skilled in the art" teaches or suggests such a modification as proposed in the Office Action. In particular, Applicant asserts that one of ordinary skill in the art will know that an epoxy which is curing will give its strongest bond if left undisturbed, and that the strength of the bond is likely to be compromised if partially cured material is "reformed" or reshaped in any way. Thus, the method of Nguyen, which allows sufficient time for frame/die assemblies to cure with out physical disturbance to partially cured material is preferable. In contrast, Applicant's method, in which a snap curing adhesive is smashed into a thin layer, all the while in contact with a heated, curing-temperature surface which acts to instantly initiate cure in the material contacted by it. In the case of adhesives which

cure in time scales which are on the order of the time or less time than required to place and position the heated die, adhesive is being pressed during the cure time for such adhesive.

Second, for the above reason, the practitioner would expect the bond between the die and the lead frame to be much less sturdy than the bond created by Nguyen's method. Thus, success is quite uncertain. Third, the elements combined as proposed in the Office Action do not include the requirement that the die, heated to a temperature capable of effecting curing of the snap-cure adhesive, be pressed against the adhesive, deforming it. Applicant thus submits that claim 1, as amended, is allowable, and claims 3 through 4 are allowable as depending from an allowable independent.

With regard to amended independent claim 6, Applicant respectfully submits that the arguments for amended claim 1 apply. It should be noted, however, that claim 1 differs from claim 6 in that the assembly must be formed within the cure time of the adhesive because the adhesive. Claim 6 is respectfully deemed allowable, with claims 7 and 8 allowable as depending from an allowable independent.

Obviousness Rejection Based on Nguyen (U.S. Patent 5,155,066) in view of Evers (U.S. Patent 5,810,926) or Japan '156 (Derwent acc number 1995-002639)

Claim 5 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Nguyen (U.S. Patent 5,155,066) in view of Evers (U.S. Patent 5,810,926) or Japan '156 (Derwent acc number 1995-002639). Applicant respectfully traverses this rejection, as hereinafter set forth.

With respect to claim 5, the amendment of claim 1 and the arguments addressed to the rejection of claims 1, 3, 4 are respectfully deemed to apply to the present rejection of claim 5. The Applicant respectfully submits that in light of the amendments to claim 1, claim 5 is allowable as depending from an allowable independent claim.

Applicant requests entry of this amendment for the following reasons:

The amendment is timely filed.

The amendment places the application in condition for allowance.

The amendment does not require any further search or consideration.

In summary, Applicant submits that claims 1 and 3 through 8 are clearly allowable over the cited prior art.

Applicant requests the entry of this amendment, the allowance of claims 1 and 3 through 8, and the case passed for issue.

Respectfully submitted,



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